



Optimization of the Ophthalmic Service in Diabetic Retinopathy (Literature Review)

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Received 2nd Nov 2022,
Accepted 3rd Dec 2022,
Online 13th Jan 2023

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Abstract: In recent years, a significant increase in the incidence of diabetes mellitus (DM) has been observed in all countries. The World Health Organization (WHO) considers diabetes mellitus as an epidemic of a specific non-communicable disease.

Diabetic retinopathy is a complication of diabetes mellitus that leads to damage to the retinal vessels and the development of microaneurysms, as well as the proliferation of newly formed vessels in the fundus. The problem of early diagnosis and treatment of diabetic retinopathy continues to be one of the urgent problems of modern ophthalmology, this is due to the late appeal of patients with diabetic retinopathy.

Key words: Diabetes mellitus, diabetic retinopathy, fundus.

Relevance. Prevention of diabetic retinopathy is one of the urgent problems, both in the field of domestic and foreign healthcare, due to the progressive increase in the prevalence of diabetes among the population, which ultimately leads to loss of vision and social insufficiency.

As T.V. Bobr, the social significance and relevance of the problem of early diagnosis of DR is to prevent disability and blindness in people of working age with diabetes mellitus and improve their quality of life [14].

2013 systematic review by Ruta LM et al., who studied the prevalence of DR among the population of developing countries, showed that the prevalence of DR ranged from 10% to 61% in people with known diabetes and from 1.5 to 31% in newly diagnosed diabetes [15].

Comparative analysis of the prevalence of DM and DR in the UK in the period from 2007 to 2010 showed that there were 76127 patients with DM, who had non-proliferative DR in 59.6-67.3% of cases, and proliferative DR in 18.3-20.9% of cases. Clinically significant macular edema was present in 15.8-18.1% of cases [16].

Currently, there are 5 million blind people in the world and 180 million with reduced vision. Presumably, by 2030 the number of the blind will increase by 27%, and those with reduced vision by 45% (WHO, 2002). Diabetic retinopathy (DR) was first described over 100 years ago by Mac Kenzie in 1879, however, today this complication of diabetes mellitus is a major public health problem.

Despite the widespread introduction of new effective drugs and instrumental methods for the diagnosis and treatment, DR still remains the main cause of vision loss. Different figures are given for the prevalence of DR in type 1 and type 2 diabetes mellitus in different countries. In patients with undiagnosed type 2 diabetes, signs of DR are detected at the time of diagnosis in 7–30% of patients. Moreover, proliferative DR is not a big problem for them, in contrast to DM 1, while diabetic maculopathy becomes the main cause of deterioration in visual acuity [1, 2, 3, 4].

The age of DM1 patients can be considered as a risk factor. It is well known that DR is extremely rare in childhood. However, with the onset of puberty, there is a rapid progression of microvascular complications, including diabetic retinopathy. This is due to the fact that during this period there is a powerful hormonal restructuring, accompanied by the production of a large number of contrainsular factors - tropic hormones of the pituitary gland, sex steroids, growth factors. The decompensation of DM that develops in this case can be explained by a rapid increase in body weight and, as a result, an increase in the need for insulin. The period of puberty is the most threatened in terms of the progression of DR [4, 5, 6, 7, 8, 9].

It is important to remember that the organization of a clear system for the detection and treatment of diabetic retinopathy should lead to a reduction in the risk of blindness, which will be expressed, among other things, in a significant economic effect. Suffice it to say that the annual cost of treatment (laser) of one patient with diabetic retinopathy is almost 12 times lower than the state social costs (pensions) per blind person [10].

Thus, the organization of an affordable system for the treatment of retinopathy with laser methods will be economically beneficial, taking into account the material costs for the payment of disability benefits borne by the state, as well as indirect losses due to the inability to take part in the production of a large number of people of working age with low vision and blindness due to diabetic retinopathy. Of course, it is impossible to take into account the moral losses from human suffering in material terms [11].

However, it must be emphasized that there are various potential barriers to preventing late complications of diabetes mellitus. Thus, according to WHO, the main obstacles to highly effective prevention of blindness due to diabetic retinopathy are [12];

- ✓ lack of information in diabetic patients about diabetic retinopathy and its consequences;
- ✓ lack of understanding among primary care physicians about the manifestations of vision-threatening diabetic retinopathy, since it is very often asymptomatic;
- ✓ lack of understanding among primary care physicians about the benefits of timely detection of diabetic retinopathy and the effectiveness of its treatment using laser coagulation ; – lack of necessary ophthalmoscopic skills in primary care physicians;
- ✓ lack of laser devices for the treatment of diabetic retinopathy;
- ✓ lack of experienced ophthalmologists specializing in the treatment of diabetic retinopathy.

Therefore, even in countries where programs for screening for retinopathy and dynamic monitoring of patients with diabetes mellitus have existed for a long time, less than half of patients who need an ophthalmological examination seek advice, and less than half of those who apply receive an adequate ophthalmological examination [13].

It has been established that less than a third of patients after diagnosing diabetes visited an ophthalmologist, only a sixth of people without DR and less than 10% of people with DR are examined by an ophthalmologist every year, most of the reasons that did not allow visiting an ophthalmologist is the lack of interest of the patient himself, while the frequency of visits to the

ophthalmologist is in inverse relationship with age of patients (OR = 1.091; 95% CI 1.048-1.136), age of onset of DM (OR = 1.077; 95% CI 1.032-1.125), duration of DM (OR = 1.156; 95% CI 1.055-1.267), the duration of DR (OR=1.202; 95% CI 1.054-1.371), in direct proportion to the level of income (OR=4.539; 95% CI 2.054-10.027), the presence of an ophthalmologist at the place of residence (OR=2.208; 95% CI 1.022-112 4.768), as well as the type of DM (OR=4.623; 95% CI 1.837-11.632), whether the ophthalmologist explained the complications and methods of prevention and treatment of DR (OR=4.026; 95% CI 1.819-8.912) [17].

According to the WHO Research Group on DR, the main obstacles to effective prevention of blindness are: unplanned work of polyclinic ophthalmologists, fundus examination with a narrow pupil, untimely referral of patients for laser treatment, lack of necessary equipment and experienced ophthalmologists specializing in the treatment of DR, significant remoteness from the regional center and the high cost of travel to specialized institutions [18, 19, 20, 21].

Extremely important activities are the organization of Associations of people suffering from diabetes, the release of special brochures for patients, publications on medical topics in the media and the expansion of the topics of existing programs on television [22].

The leading factor in the prevention, stabilization and treatment of DR is not only the rational therapy of DM, but also the organization of a clear system for the detection and treatment of DR, which leads to a decrease in cases of vision loss and an increase in the quality of life of patients [23, 24]

The problem of preventing blindness in DM is of an organizational nature and requires a clear interaction of doctors of various specialties in the management of patients with DM, timely referral of the patient to an ophthalmologist, adequate ophthalmological examination, assessment of the risk of progression and deterioration of vision, and timely initiation of treatment [25, 26, 27, 28, 29, 30]. However, according to the conclusion of the WHO research group, the main obstacles to effective prevention of blindness from DR are the unplanned work of polyclinic ophthalmologists, the study of the fundus with a narrow pupil, the untimely referral of patients for laser treatment, the lack of the necessary equipment and experienced ophthalmologists specializing in the treatment of DR, the complexity travel to the regional center and the high cost of travel to specialized institutions [31,32,33].

Thus, the analysis of the literature made it possible to determine and reveal that the issues of improving the organization of early diagnosis and properly balanced treatment of diabetic retinopathy today remain among the urgent problems of ophthalmology.

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